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Fact Sheet

POWER SECTOR OPPORTUNITIES FOR REDUCING CARBON DIOXIDE EMISSIONS: ILLINOIS

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WHAT WILL CO_2 STANDARDS MEAN FOR ILLINOIS?

President Obama announced a national climate plan in June 2013 and directed the U.S. Environmental Protection Agency (EPA) to set carbon pollution standards for the power sector. Once EPA establishes those standards, states will implement their own plans for achieving those reductions. In this fact sheet, WRI examines existing tools Illinois can use to reduce power plant emissions.

HOW ILLINOIS CAN REDUCE POWER SECTOR EMISSIONS

WRI analysis shows that Illinois has many opportunities to reduce carbon pollution from its power sector. Illinois is in a strong position to meet moderately ambitious emissions standards for existing power plants in the near term. Carbon dioxide emissions from the state's power sector were 2 percent below 2005 levels in 2011 (the most recent year with available energy data). According to reference case projections based on the Energy Information Administration's (EIA) *Annual Energy Outlook 2012* (*AEO 2012*), emissions are expected to continue to fall through 2020—due to a shifting fuel mix away from coal—before increasing slightly to 3 percent above 2011 levels by 2030. This reference case includes the state's existing renewable portfolio standard (RPS) and energy efficiency resource standard (EERS; see below for more detail).[1] We adjusted the reference case to assume that, in order to help comply with new CO_2 standards, all new renewable energy generation for compliance with the RPS occurs in-

Box 1 | What's Ahead for the Power Sector?

The power sector is the leading source of carbon dioxide (CO_2) emissions in the United States, but also offers some of the most cost-effective opportunities to reduce those emissions. Despite recent decreases in power sector emissions—due to the recession, increasing competition from renewable energy and the low price of natural gas—current projections show that, absent policy action, emissions will increase in the coming decades.[2]

New Power Plants: On September 20, 2013, EPA proposed CO_2 emissions standards for new power plants.[3] These standards will provide a backstop ensuring new power plants produce significantly lower CO_2 emissions per megawatt-hour of power generation than the average existing coal plant, requiring coal plants to achieve emissions rates of 1,000 – 1,100 pounds of CO_2 per megawatt-hour (lbs. per MWh), large natural gas plants to achieve 1,000 lbs. per MWh, and smaller natural gas plants to achieve 1,100 lbs. per MWh. However, because new coal plants are unlikely to be built even in the absence of the standards—due to relatively low natural gas prices, among other factors[4]—it is unlikely that the new power plant standards will have a significant impact on near-term CO_2 emissions.

Existing Power Plants: EPA also has been directed to (a) propose CO_2 emissions standards for existing power plants by June 1, 2014; (b) finalize these standards by June 1, 2015; and (c) require states to submit their proposed implementation plans by June 30, 2016. The Clean Air Act provides EPA with considerable flexibility in setting guidelines for states to meet these standards. States could be allowed to pursue a range of programs that encourage activities—such as fuel switching, dispatch of existing low-carbon power plants, increased generation by renewable sources, and energy efficiency, among other options—for meeting emissions targets. EPA also could set guidelines that allow for emissions rate averaging across power sector generation units to help meet the standard.

state, as opposed to purchasing renewable energy credits generated out-of-state.[5]

Illinois can reduce power sector CO_2 emissions to 35 percent below 2011 levels in 2020 by achieving the targets in these existing state policies and taking advantage of the CO_2 reduction opportunities that use the existing infrastructure listed below.[6] This is equivalent to a 36 percent reduction in emissions from 2005 levels. Reductions of this magnitude would meet or exceed moderately ambitious standards for existing power plants.[7]

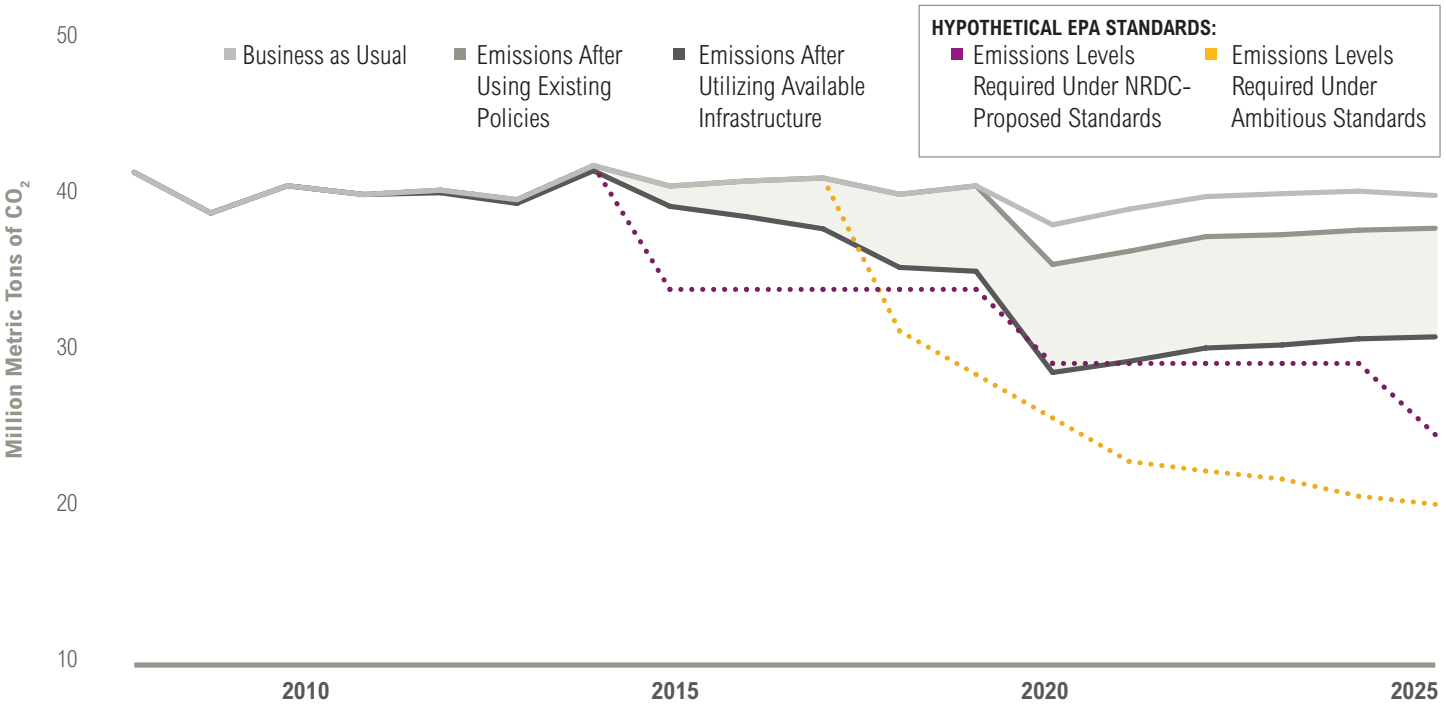
CO_2 reduction opportunities *using existing policies* include:

- **Meeting renewable energy targets.** Illinois has a renewable energy standard in place requiring 25 percent of the electricity sold by its investor-owned utilities to come from renewables by 2025. *Meeting this requirement by adding new renewable generation in Illinois will reduce CO_2 emissions by 17 percent below 2011 levels in 2020.*
- **Meeting energy efficiency targets.** The state's existing efficiency standard requires utilities to implement programs that help customers save energy. *Meeting this standard can reduce Illinois' CO_2 emissions by 9 percent below 2011 levels in 2020.*[8]

CO_2 reduction opportunities *using available infrastructure* include:

- **Using more gas.** The state's most efficient natural gas plants—combined cycle (NGCC) units—generated much less electricity than they were capable of producing in 2011. *Running existing NGCC plants at 75 percent can reduce CO_2 emissions by 8 percent below 2011 levels in 2020.*
- **Increasing existing coal plant efficiency.** Existing coal plants could save energy by upgrading their equipment and making other operational improvements. *Increasing coal plant efficiency by 2.5 percent could reduce CO_2 emissions by 1 percent below 2011 levels by 2020.*
- **Using more combined heat and power (CHP).** Illinois has the potential to use more CHP systems—which use waste heat to generate electricity more efficiently than the average power plant—at sites like universities, hospitals, and manufacturing facilities. *Increasing the use of CHP could help the state meet its energy efficiency targets.*

Figure 1 | **Illinois Carbon Dioxide Reduction Opportunities for Power Sector Compliance Under The Clean Air Act**



Note: EPA has not yet proposed a national emissions standard for existing power plants. For purposes of illustration, this analysis shows emissions reductions that would occur if EPA adopted the Natural Resources Defense Council's (NRDC) proposed standards for existing power plants, which would require CO_2 emissions reductions in Illinois of 32 percent below 2011 levels in 2020. We also show the emissions reductions that would occur if EPA adopted a more ambitious "go-getter" reduction schedule, which aligns with a national reduction pathway necessary to meet the Obama Administration's goal of reducing emissions 17 percent below 2005 levels by 2020.[9] National power sector emissions in the "go-getter" scenario drop 38 percent from 2005 to 2020; we show the equivalent percent reductions applied to Illinois' power sector (37 percent from 2011 to 2020). See endnote 7 for additional explanation.

Illinois could achieve even greater long-term emissions reductions by expanding existing policies. By taking the actions listed below, which would likely require additional legislation, Illinois can reduce power sector CO_2 emissions to 51 percent below 2011 levels by 2030.[10,11]

- Expanding the RPS (-10 percent in 2030 compared to 2011 levels)
- Further increasing CHP capacity at commercial and industrial facilities could help Illinois meet its energy efficiency standard

OPPORTUNITIES IN DETAIL

Existing Energy Efficiency Resource Standards. In 2007, Illinois enacted an energy efficiency resource standard requiring annual electricity savings ramping up to 1 percent in 2012 and 2 percent in 2015 and each year thereafter.[12] The standard is subject to a rate impact cap, which limits how much customers can be charged to offset program implementation costs. If utilities demonstrate that efficiency programs will increase their customers' per-kwh electricity charges more than 2 percent, annual electricity savings goals may be lowered.[13] To meet their savings goals, Illinois' utilities offer a variety of energy saving programs to their customers, including rebates, financing options, and energy assessments. The Natural Resources Defense Council estimates that the energy efficiency standard will save customers $500 million per year starting in 2015, ramping up to over $1 billion per year in 2025.[14] Meeting the existing standard can reduce power sector emissions by about 9 percent in 2020 compared to 2011 levels.[15]

Existing and Expanded Renewable Energy Standards. Illinois' renewable portfolio standard requires 25 percent of the electricity sold by its investor-owned utilities to be generated by renewable sources by 2025.[16] To the extent that it is available, at least 75 percent of the requirement each year must be met with wind and, by 2015, 6 percent of the requirement must be met with solar. To meet this standard, Illinois must increase its renewable sales by about 1 percent per year between 2011 and 2025. According to EIA data, renewable generating capacity in Illinois

has grown significantly in recent years, from 1.8 gigawatts (GW) in 2009 to nearly 3 GW in 2011. Over 900 MW of new wind and solar capacity were added in 2012 or planned for 2013.[17] The Illinois Power Agency found that the RPS enabled significant job creation and economic development opportunities and that the growth of wind energy contributed to reduced electricity rates in the state in 2011.[18]

By meeting its renewable standard through new in-state generation going forward,[19] Illinois can reduce its power sector emissions by an additional 17 percent in 2020 compared to 2011 levels beyond the reductions captured in the *AEO 2012* reference case. If Illinois continues to increase its renewable sales at about 1 percent per year after its target has been reached in 2025, it can reduce power sector CO_2 emissions by an additional 10 percent in 2030 compared to 2011 levels.

Increasing CHP at Commercial and Industrial Facilities. According to ICF International, Illinois has significant technical potential for CHP, with the potential to add 7.5 GW of new CHP for a total technical potential of 8.8 GW.[20] As of July 2013, Illinois had 1.3 GW of installed CHP capacity, about 15 percent of its technical potential.[21] While Illinois has favorable interconnection standards and treats renewable-fueled CHP as an eligible resource under its RPS, the state has the opportunity to take additional steps to encourage additional CHP deployment.[22] The State and Local Energy Efficiency Action Network found that many industrial facilities can achieve annual energy savings of 15 percent or greater with systems that pay for themselves in under three years.[23]

If the state ramped up CHP capacity on a path to achieve 25 percent of additional technical potential for new CHP by 2030 (for a total of 36 percent of total technical potential), it could help the state meet its EERS.[24]

Utilizing Slack Natural Gas Capacity. According to EIA data, the capacity factor of Illinois' existing combined cycle natural gas fleet was only 12 percent in 2011—meaning that these plants generated much less electricity than they were capable of producing.[25] Increasing the capacity factor of these existing units to 75 percent would cut power sector CO_2 emissions by 8 percent in 2020 compared to 2011 levels.[26,27] See Box 3 for additional information on Illinois' power sector.

Increasing Efficiency at Existing Coal Plants. According to the National Energy Technology Laboratory (NETL) and researchers at Lehigh University, the existing coal fleet could achieve a 5 percent increase in efficiency on average.[28] For purposes of this analysis, we conservatively assume that Illinois' coal fleet would achieve a 2.5 percent increase in efficiency, half of these potential levels. While there are high upfront costs associated with refurbishing existing coal units, the resulting increase in unit efficiency will lead to annual fuel savings.[29] Existing coal plants can increase efficiency through refurbishment and improved operation and maintenance practices, though the actual efficiency potential depends on plant age and other physical limitations.[30,31] Another option to reduce the emissions intensity of a coal plant is co-firing with natural gas using the igniters that are already built into many existing pulverized coal boilers.[32] These actions can lead to reductions in power-sector CO_2 emissions of up to 1 percent compared to 2011 levels in 2020.

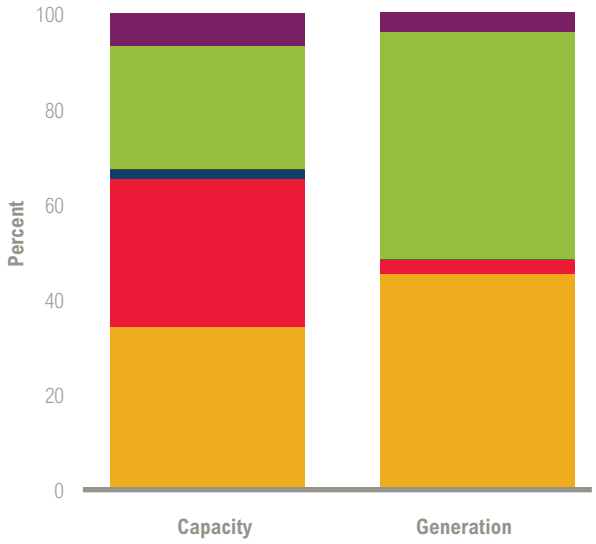
Box 2 | About This Series

In *Can The U.S. Get There From Here?*, WRI identified four key actions the Obama Administration must take in the absence of congressional action in order to meet the U.S. commitment to reducing greenhouse gas (GHG) emissions by 17 percent below 2005 levels by 2020. These actions include setting performance standards for existing power plants, reducing consumption of hydrofluorocarbons, reducing fugitive methane emissions from natural gas systems, and increasing energy efficiency. Of these four actions, the greatest opportunity for reductions comes from the power sector. In his recently announced Climate Action Plan, President Obama has directed EPA to work expeditiously to finalize carbon dioxide (CO_2) emissions standards for new power plants and adopt standards for existing power plants. As states prepare to comply with these standards, it will be necessary to understand available opportunities for reducing CO_2 emissions from the power sector. This series of fact sheets aims to shed light on these opportunities by illustrating the CO_2 emissions reduction potential from measures in a variety of states. We show how these emissions savings stack up against the reductions that could be required under forthcoming standards. This series is based on WRI analysis conducted using publicly available data. See the appendix for additional information on our methodology and modeling assumptions.[33]

Box 3 | Illinois Power Sector Profile

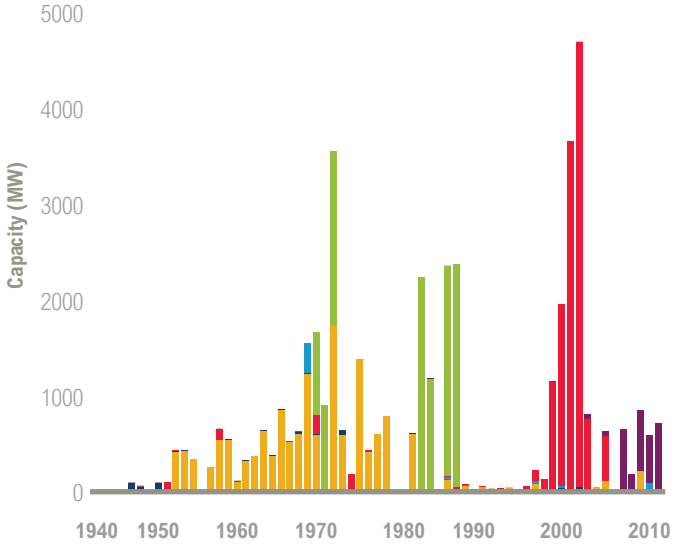
Until the 1990s, most new capacity being built in Illinois was coal-fired or nuclear power. Since then, natural gas has comprised the bulk of new capacity additions.[34] Renewable generating capacity has grown significantly since 2006, and over 900 MW of new wind and solar capacity were added in 2012 or planned for 2013. (Note that the chart below only goes through 2011.) Coal-fired generation in the state decreased 3 percent from 2005 to 2011 as overall electricity demand increased slightly. Coal comprised 45 percent of in-state generation in 2011, while nuclear and renewable sources comprised 48 percent and 4 percent, respectively. Still, the fuel mix may continue to shift away from coal as more renewable capacity comes on-line and the state's aging coal plants are retired. As of 2012, 17 coal generators comprising 15 percent of the state's 2011 existing coal capacity (2,400 MW capacity) had been slated for retirement.[35] In 2011, Illinois contributed 4 percent of total U.S. CO_2 emissions in the power sector and 5 percent of electricity generation, with a state CO_2 emissions intensity of 1,050 lbs. per MWh. While this is lower than the U.S. average (about 1,200 lbs. per MWh), our analysis shows that by using existing policies and infrastructure, Illinois could reduce the carbon intensity of its power sector to around 650 lbs. per MWh by 2020.

Illinois Generation and Generating Capacity by Fuel, 2011



Source: U.S. Energy Information Administration Form EIA-860 and Annual Energy Review

New Electric Generating Capacity Additions by Fuel Type



Source: U.S. Energy Information Administration Form EIA-860, which includes existing electric generating units at plants with at least 1 MW capacity (electric utilities, independent power producers, and combined heat and power plants) that are connected to a power grid. Data represents installed summer capacity.

BOTH CHARTS USE THE FOLLOWING LEGEND: Coal | Natural Gas | Oil | Other Fossil | Nuclear | Renewables

OUTLOOK FOR ILLINOIS

Illinois has already put measures in place that will achieve CO_2 emissions reductions and has the opportunity to achieve greater reductions building off of its progress to date. By meeting the requirements of its existing renewable energy and energy efficiency standards and taking advantage of available infrastructure and underutilized resources, Illinois is in a good position to comply with moderately ambitious EPA standards for existing power plants in the near term. Through federal and state-level actions, the United States can meet its commitment to reduce emissions 17 percent below 2005 levels by 2020.

ENDNOTES

1. *AEO 2012* does not explicitly model state EERS. We conservatively assumed that these standards would be incorporated into the reference case through regional demand trends.
2. According to the Energy Information Administration's (EIA) 2013 *Annual Energy Outlook* reference case, CO_2 emissions from the power sector will be 14 percent below 2005 levels by 2020 and only 5 percent below 2005 levels by 2035. See U.S. Department of Energy/Energy Information Administration. 2013. *Energy-Related Carbon Dioxide Emissions by Sector and Source, United States, Reference Case.* In U.S. DOE/EIA. Annual Energy Outlook 2013. Washington, D.C.: Government Printing Office. Accessible at: <http://www.eia.gov/forecasts/aeo/>.
3. For more information, see: <http://www2.epa.gov/carbon-pollution-standards/2013-proposed-carbon-pollution-standard-new-power-plants>.
4. U.S. Department of Energy/Energy Information Administration. 2013. *Electric Generating Capacity, Reference Case.* In U.S. DOE/EIA. 2013. Annual Energy Outlook 2013. Washington, D.C.: Government Printing Office. Accessible at: <http://www.eia.gov/forecasts/aeo/>. For more details, see also: <http://insights.wri.org/news/2012/04/electricity-markets-increasingly-favor-alternatives-coal>.
5. *AEO 2012* models compliance with renewable portfolio standards through a combination of in-state generation and out-of-state purchases of renewable energy credits (RECs). In Illinois, many of the RECs that result from renewable energy generated in-state are sold to out-of-state customers. Illinois utilities have been meeting their RPS obligations in part with RECs purchased from out-of-state, although the exact proportion is not publicly available (personal communication, Sarah Wochos, Environmental Law and Policy Center). It is not yet clear how EPA will credit RECs that are sold or purchased out-of-state. For purposes of this analysis, we treat all renewable electricity generated in-state as though it were used to comply with the state's RPS. We also assume all new renewable electricity generated after 2011 (the most recent year with available data) for compliance with the RPS occurs in-state to help comply with new CO_2 standards, and adjust the reference case accordingly. The National Renewable Energy Laboratory shows that the state's technical potential for solar (rural and urban utility scale and rooftop) and wind resources could generate over 40 times the state's electric generation in 2011. (See A. Lopez et al. 2012. *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*. NREL/TP-6A20-51946. Golden, CO: National Renewable Energy Laboratory. Accessible at: <http://www.nrel.gov/gis/re_potential.html>.)
6. The sum of reductions from the individual measures listed—along with the reductions captured in the reference case—may not match this total due to rounding. We calculated emissions reductions for existing policies using the annual reference case emissions rates for each fuel type. See the appendix for additional information on the assumptions and methodology used for this analysis (accessible at: <http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_methodology.pdf>).
7. EPA has not yet proposed a national emissions standard for existing power plants. To illustrate the possible stringency of the future standards, this analysis shows emissions reductions for two scenarios. Proposed standards by the Natural Resources Defense Council (accessible at: <http://www.nrdc.org/air/pollution-standards/files/pollution-standards-report.pdf>) would result in CO_2 emissions reductions in Illinois of 32 percent below 2011 levels in 2020. In WRI's *Can the U.S. Get There From Here?*, which focuses on reductions from 2005 levels, the most stringent scenario (the "go-getter" scenario) would achieve a 38 percent

reduction from the power sector nationally between 2005 and 2020. For Illinois, this is equivalent to a 37 percent reduction from 2011 levels. (It is unlikely that EPA standards would require identical reductions in each state, given the wide variation in emission intensities when the standards will be implemented.)

8. We assume the CO_2 savings associated with the existing energy efficiency standard are incorporated in the *AEO 2012* reference case.
9. N. Bianco, F. Litz, K. Meek, and R. Gasper. 2013. *Can The U.S. Get There From Here? Using Existing Federal Laws and State Action to Reduce Greenhouse Gas Emissions*. Washington, DC: World Resources Institute. Accessible at: <http://pdf.wri.org/can_us_get_there_from_here.pdf>.
10. Emissions reductions calculated using the emissions rate resulting from the adjusted reference case projection that includes Illinois' EERS and RPS policies. Reductions listed as a result of expanded policies are additional to reductions from existing policies.
11. Illinois' energy efficiency resource standard is already at the upper limit of what we considered for expanded policies in this series. To remain conservative, we do not include an increased efficiency standard beyond this level in our expanded policies. If Illinois does achieve greater energy efficiency savings, the state could further reduce its power sector CO_2 emissions.
12. Illinois Public Act 095-0481. Accessible at: <http://www.ilga.gov/legislation/publicacts/95/095-0481.htm>.
13. We assume that the electricity savings achieved from the EERS are consistent with what was contained in the original legislation. If electric savings goals are reduced in the future, emissions reductions may be less than presented here.
14. Estimates prepared by the American Council for an Energy Efficient Economy for the Natural Resources Defense Council in 2011. Accessible at: <http://switchboard.nrdc.org/blogs/rstanfield/today_illinois_senate_presiden.html>.
15. We assumed that all CO_2 benefits from meeting the existing energy efficiency resource standard are captured in the *AEO 2012* reference case.
16. Illinois Public Act 095-0481. Accessible at: <http://www.ilga.gov/legislation/publicacts/95/095-0481.htm>.
17. EIA-860 database. Accessible at: <http://www.eia.gov/electricity/data/eia860/>.
18. The Illinois Power Agency. 2012. *Annual Report: The Costs and Benefits of Renewable Resource Procurement in Illinois Under the Illinois Power Agency and Illinois Public Utilities Acts*. Accessible at: <http://www2.illinois.gov/ipa/Documents/April-2012-Renewables-Report-3-26-AAJ-Final.pdf>.
19. For purposes of this analysis, we assume that in the face of new CO_2 standards, all new renewable electricity generated for compliance with the state's RPS occurs within the state. See endnote 5 for additional information.
20. ICF International. 2009. *Effect of a 30 Percent Investment Tax Credit on the Economic Market Potential for Combined Heat and Power*. Accessible at: <http://www.localpower.org/WADE_USCHPA_ITC_Report.pdf>.
21. ICF CHP database. Accessible at: <http://www.eea-inc.com/chpdata/>.
22. In 2012, Illinois ranked fifth on ACEEE's *State Energy Efficiency Scorecard* rating based on its adoption of measures to encourage deployment of CHP systems. Other measures the state could take include offering financial incentives, favorable net metering regulations, financing options, technical support and guidance, and other supportive programs and policies.
23. *Industrial Energy Efficiency and Combined Heat and Power*. SEE Action Network, July 2012. Accessible at: <http://www1.eere.energy.gov/seeaction/pdfs/industrial_factsheet.pdf>.
24. Under Illinois' energy efficiency resource standard, efficiency measures must be approved by the Illinois Commerce Commission. To remain conservative, we assume that all CHP projects will be considered eligible and thus do not generate additional savings beyond the EERS. If any CHP projects are not deemed eligible toward the EERS, there may be additional CO_2 emissions savings beyond what we present in this analysis.
25. WRI estimates based on data from U.S. Energy Information Administration, EIA-923 Generation and Fuel Data, <http://www.eia.gov/electricity/data/eia923/>; and EIA-860 Annual Electric Generator Data, <http://www.eia.gov/electricity/data/eia860/>.
26. NGCC units are designed to be operated up to 85 percent capacity (see <http://mitei.mit.edu/system/files/NaturalGas_Chapter4_Electricity.pdf>), but actual maximum capacity factors may differ among units. We assume a conservative maximum capacity factor of 75 percent.
27. We did not account for the increases in methane associated with the increased production of natural gas due to a higher demand for the fuel. Going forward, industry should work with EPA to reduce methane leakage rates from natural gas systems. For additional information, see:<http://www.wri.org/publication/clearing-the-air>.
28. P. DiPetro and K. Krulla. 2010. I*mproving the Efficiency of Coal-Fired Power Plants for Near Term Greenhouse Gas Emissions Reductions*. National Energy Technology Laboratory, Office of Systems, Analyses and Planning. DOE/NETL-2010/1411. Accessible at: <http://www.netl.doe.gov/energy-analyses/pubs/ImpCFPPGHGRdctns_0410.pdf>. C. Nichols, G. Vaux, C. Zaremsky, J. Murphy, and M. Ramezan. 2008. *Reducing CO_2 Emissions by Improving the Efficiency of the Existing Coal-fired Power Plant Fleet*. National Energy Technology Laboratory, Office of Systems, Analyses, and Planning, and Research and Development Solutions, LLC. DOE/NETL-2008/1329. Accessible at: <http://www.netl.doe.gov/energy-analyses/pubs/CFPP%20Efficiency-FINAL.pdf>. *Analyses Show Benefits of Improving Unit Heat Rate as Part of a Carbon Mitigation Strategy*. Lehigh Energy Update 28 (1), February 2010. Accessible at: <http://www.lehigh.edu/~inenr/leu/leu_65.pdf>.
29. For example, the National Energy Technology Laboratory found a payback period of less than four years for a refurbishment technology that achieves a 2 percent heat rate improvement. For more information, see *Benefits of the Big Bend Power Station Project*, National Energy Technology Laboratory. Accessible at: <http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/pubs/tampa.pdf>; and *Analyses Show Benefits of Improving Unit Heat Rate as Part of a Carbon Mitigation Strategy*. Lehigh Energy Update 28 (1), February 2010. Accessible at: <http://www.lehigh.edu/~inenr/leu/leu_65.pdf>.
30. P. DiPetro and K. Krulla. 2010. *Improving the Efficiency of Coal-Fired Power Plants for Near Term Greenhouse Gas Emissions Reductions*. National Energy Technology Laboratory, Office of Systems, Analyses and Planning. DOE/NETL-2010/1411. Accessible at: <http://www.netl.doe.gov/energy-analyses/pubs/ImpCFPPGHGRdctns_0410.pdf>.
31. "Regulating Greenhouse Gas Emissions Under the Clean Air Act." 73 Register §147(2008). Accessible at: <http://www.gpo.gov/fdsys/pkg/FR-2008-07-30/pdf/E8-16432.pdf>.
32. Personal communication with Tomas Carbonell, Environmental Defense Fund, July 12, 2013.
33. World Resources Institute. 2013. *Power Sector Opportunities For Reducing Carbon Dioxide Emissions. Appendix A: Detailed Overview Of Methods*. Washington, DC: World Resources Institute. Accessible at: <http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_methodology.pdf>.
34. Unless otherwise indicated, we relied upon the U.S. Energy Information Administration Annual Energy Review and Form EIA-860 for data reported in Box 3.

35. Union of Concerned Scientists. 2012. *Ripe for Retirement: The Case for Closing the Nation's Costliest Coal Plants*, Cambridge, MA: UCS Publications.
36. World Resources Institute. 2013. *Power Sector Opportunities For Reducing Carbon Dioxide Emissions. Appendix A: Detailed Overview Of Methods.* Washington, DC: World Resources Institute. Accessible at: <http://www.wri.org/sites/default/files/power_sector_opportunities_for_reducing_carbon_dioxide_emissions_methodology.pdf>.

POLICY FRAMEWORK AND INTERACTION

This analysis assumes the existing policies and other reduction opportunities listed above are fully implemented. Depending on the combination of measures actually implemented by Illinois, each will have different impacts on the generation mix and resulting emissions. For example, increasing the efficiency of existing coal-fired power plants results in fewer emissions reductions in this analysis than would be the case if it were considered in isolation, because implementation of the EERS and RPS and an increase in natural gas generation all decrease the state's coal-fired generation. The emissions reductions presented in the text are a result of each policy in combination with all other policies. We first applied the existing RPS to calculate an adjusted reference case assuming the standard is met through in-state generation. Next, we increased CHP capacity and increased utilization of existing natural gas capacity compared to this adjusted reference case. Last, we increased the efficiency of any remaining coal plants. When considering the expanded policies, we applied the expanded EERS followed by increased CHP capacity, and then applied the expanded RPS to the resulting adjusted demand.

Equally as important is the policy framework, which will define how each of these measures counts toward compliance under EPA's standards. We assumed that the emissions reductions from each measure would count directly toward the standard. State measures may be counted differently in the actual standards, thus actual compliance levels could potentially be greater or less than what was modeled. See the appendix for additional information on our methodology and modeling assumptions.[36]